Bayer Advanced LLC

MATERIAL SAFETY DATA SHEET

BAYER ADVANCED LLC
1500 Urban Center Dr.
Birmingham, AL 35242

TRANSPORTATION EMERGENCY:
CALL CHEMTREC: (800) 424-9300
DISTRICT OF COLUMBIA: (202) 483-7616

NON-TRANSPORTATION:
BAYER EMERGENCY PHONE: (877) 229-3763
BAYER INFORMATION PHONE: (877) 229-3724

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME: BAYER ADVANCED GARDEN Rose & Flower Insect Killer Concentrate

PRODUCT CODE: 41736

CHEMICAL FAMILY: Chloronicotinyl (imidacloprid); pyrethroid (cyfluthrin)

CHEMICAL NAME: 1-((6-Chloro-3-pyridinyl)methyl)-N-nitro-2-imidazolid-inimine; Cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2-dichloroethen-yl)-2,2-dimethylcyclopropanecarboxylate

SYNONYMS: Imidacloprid, Cyfluthrin

FORMULA: C22 H18 Cl2 F N 03 (cyfluthrin); C9 H10 Cl N5 02 (imidacloprid)

PRODUCT USE: Consumer Insecticide

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
***** HAZARDOUS INGREDIENTS *****		
Cyfluthrin		
68359-37-5	OSHA : Not Established ACGIH: Not Established	0.72%
Imidacloprid		
138261-41-3	OSHA : Not Established ACGIH: Not Established	0.72%
Ingredient 1979		
Specific chemical identity is withheld as a trade secret.	OSHA : Not Established ACGIH: Not Established	1-3%
Ingredient 2035		
Specific chemical identity is withheld as a trade secret.	OSHA : Not Established ACGIH: Not Established	1-3%

3. HAZARDS IDENTIFICATION:

EMERGENCY OVERVIEW CAUTION!

Color: Tan; **Form:** Liquid; Opaque; Harmful if inhaled or ingested; Causes eye irritation.

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY: Inhalation; Skin Contact; Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE EFFECTS OF EXPOSURE: Exposure during the labeled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. Sufficient exposures to cyfluthrin, an active ingredient in this product, may cause eye or skin irritation characterized by redness or itching. In addition, sufficient exposure to cyfluthrin may produce by redness or itching. In addition,

HAZARDS IDENTIFICATION Continued:

ACUTE EFFECTS OF EXPOSURE continued:

sufficient exposure to cyfluthrin may produce paraesthesia, a tingling or burning sensation on the surface of the skin. This is a frequently reported symptom associated with sufficient dermal exposure to alpha-cyano (or Type II) synthetic pyrethroids and normally subsides without treatment within 24 hours. The onset of these symptoms usually occurs 2-12 hours after exposure. Mucous membrane irritation involving the nose, throat and upper respiratory tract may occur from inhalation of aerosols containing cyfluthrin. Based on EPA Toxicity Category criteria, this product is essentially non-toxic by the oral and dermal routes of exposure.

CHRONIC EFFECTS OF EXPOSURE: Based on animal studies, no adverse effects are expected from chronic exposure to this product.

CARCINOGENICITY: This product is not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: No specific medical conditions are known which may be aggravated by exposure to the active ingredients in this product. As with all materials which can cause upper respiratory tract irritation, persons with a history of asthma, emphysema, or hyperreactive airway disease may be more susceptible to a response at low concentration.

4. FIRST AID MEASURES:

FIRST AID FOR EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

FIRST AID FOR SKIN: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

FIRST AID FOR INHALATION: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

FIRST AID FOR INGESTION: Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything to an unconscious person.

NOTE TO PHYSICIAN: The active ingredient is a cyanopyrethroid that can cause paraesthesia effects with sufficient exposure. Published data indicate that vitamin E acetate can prevent and/or mitigate symptoms of paraesthesia caused by synthetic pyrethroids.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Greater than 230°F (110°C)

EXTINGUISHING MEDIA: Foam; Dry Chemical

FIRE FIGHTING MEASURES Continued:

SPECIAL FIRE FIGHTING PROCEDURES: Keep out of smoke. Cool exposed containers with water spray. Fight fire from upwind position. Use self-contained breathing equipment. Contain runoff by diking to prevent entry into sewers or waterways. Equipment or materials involved in pesticide fires may become contaminated.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES: Isolate area and keep unauthorized people away. Do not walk through spilled material. Avoid breathing vapors and skin contact. Remove sources of ignition if combustible or flammable vapors may be present and ventilate area. Wear proper protective equipment. Dike contaminated area with absorbent granules, soil, sand, etc. If large spill, material should be recovered. Small spills can be absorbed with absorbent granules, spill control pads, or any absorbent materials. Carefully sweep up absorbed spilled material. Place in covered container for reuse or disposal. Scrub contaminated area with detergent and bleach solution and/or detergent and lye in water solution. Repeat. Rinse with water. Use dry absorbent material such as clay granules to absorb and collect wash solution for proper disposal. Contaminated soil may have to be disposed. Do not allow material to enter streams, sewers, or other waterways or contact vegetation.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE(MIN/MAX): None/30 day avg. not to exceed 100°F (38°C)

SHELF LIFE: Time/temperature-dependent. Specific information available upon request.

SPECIAL SENSITIVITY: Not established

HANDLING/STORAGE PRECAUTIONS: Do not allow product to contaminate material which is intended for use or consumption by humans or animals.

8. PERSONAL PROTECTION:

REQUIRED WORK/HYGIENE PROCEDURES: Exposure during the labeled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. However, if exposure to this product is possible while handling large quantities such as in subsequent manufacturing, transportation spills or other emergencies, the following personal protection is recommended.

EYE PROTECTION REQUIREMENTS: Splash-proof goggles

SKIN PROTECTION REQUIREMENTS: Long sleeves and trousers

HAND PROTECTION REQUIREMENTS: Chemical-resistant gloves such as latex or nitrile

VENTILATION REQUIREMENTS: Control exposure levels through the use of general and local exhaust ventilation.

RESPIRATOR REQUIREMENTS: If needed, based on the conditions of use, wear a NIOSH-approved organic vapor respirator with particulate pre-filter.

ADDITIONAL PROTECTIVE MEASURES: Clean water and soap should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of the product. Follow all label instructions. Launder clothing separately after use. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM:	Liquid
APPEARANCE:	Opaque
COLOR:	Tan
ODOR:	Not Noted

PHYSICAL AND CHEMICAL PROPERTIES Continued:

MOLECULAR WEIGHT:	255.7 (for imidacloprid); 434.3 (for cyfluthrin)	
pH:	7.1	
BOILING POINT:	Not established	
MELTING/FREEZING POINT:	Not established	
VISCOSITY:	900 cps @ 20°C	
SOLUBILITY IN WATER:	Not established	
SPECIFIC GRAVITY:		1.09 @ 20°C/20°C
BULK DENSITY:	Not applicable	
VAPOR PRESSURE:		1.5 x 10-9 mm Hg @ 20°C (for imidacloprid);

7.2 x 10-9 mm Hg @ 20°C (for cyfluthrin)

10. STABILITY AND REACTIVITY:

STABILITY:	This is a stable material.
HAZARDOUS POLYMERIZATION:	Will not occur.
INCOMPATIBILITIES:	Alkaline or oxidizing media
INSTABILITY CONDITIONS:	None known
DECOMPOSITION PRODUCTS:	None known

11. TOXICOLOGICAL INFORMATION:

Acute toxicity data are not available on this product as formulated. The non-acute information pertains to the active ingredient, imidacloprid and cyfluthrin.

SUBCHRONIC TOXICITY:

In a 3 week dermal toxicity study, rabbits were treated with the active ingredient, imidacloprid, at the limit dose level of 1000 mg/kg for 6 hours/day, 5 days/week. There were no local or systemic effects observed at any of the levels tested. The no-observed-effect-level (NOEL) was 1000 mg/kg. In a 4 week inhalation study, rats were exposed to dust concentrations of imidacloprid at 5.5, 30.5 and 191.2 mg/m3 for 6 hours/day, 5 days/week. Effects observed at the high concentration included decreased body weight gains, decreased heart and thymus weights, increased liver weights, and induction of the hepatic mixed-function oxidases. Histopathological examinations did not reveal any organ damage or local injury to the respiratory tract. The NOEL was 5.5 mg/m3 based on induction of the hepatic mixed-function oxidases. In a 3 week dermal toxicity study, cyfluthrin technical was administered to rats for 6 hours/day at dose levels of 100, 340 or 1000 mg/kg. Animals received a total of 17-18 applications in a period of 22-23 days. An additional control and high-dose group were treated and maintained for 14-15 days following treatment so as to ascertain the extent of recovery. Effects observed included reduced feed consumption, red nasal discharge, urine stains, and findings at the dose site (scabbing, crusty, discolored and raised zones). Histologically, epidermal and dermal alterations in treated skin were observed in animals of the mid- and high-dose groups. Similar, but slightly less severe microscopic alterations were also observed in the high-dose recovery group. The overall NOEL was 100 mg/kg. In a 13 week inhalation study, rats were exposed to cyfluthrin at aerosol concentrations of 0.09, 0.71 or 4.51 mg/m3 for 6 hours/day, 5 days/week. The NOEL was 0.09 mg/m3 based on reduced body weight gains.

CHRONIC TOXICITY:

Dogs were administered imidacloprid for 1 year at dietary concentrations of 200, 500 or 1250 ppm. Due to lack of significant effects, the high dose was increased to 2500 ppm at 17 weeks for the remainder of the study. Effects observed at the high dose included decreased food consumption, increased liver weights and elevated serum chemistries. The NOEL was 500 ppm. In chronic studies using rats, imidacloprid was administered for 2 years at

dietary concentrations of 100, 300, 900 or 1800 ppm. Histopathology examinations revealed an increased incidence of mineralization in the colloid of the thyroid follicles at concentrations of 300 ppm and greater. At 1800 ppm, there were

TOXICOLOGICAL INFORMATION Continued:

CHRONIC TOXICITY continued:

changes in serum chemistries and a slight increase in the incidence of parafollicular hyperplasia seen in the thyroids. Body weight gains were reduced at 900 and 1800 ppm. The overall NOEL was 100 ppm. Cyfluthrin has been investigated in chronic feeding studies using two different strains of rats. In each study, cyfluthrin was administered for 2 years at dietary concentrations ranging from 50 to 450 ppm. Body weight gains were decreased at concentrations of 150 ppm and greater. Changes in clinical chemistries occurred at 450 ppm. In one of the studies, histopathology revealed a numerical increase in mammary gland adenocarcinomas at 450 ppm. This finding was not statistically significant when compared to the controls and is not considered to be compound-related. In each study, the overall NOEL was 50 ppm based on decreased body weight gains. In a 1 year feeding study, dogs were administered cyfluthrin at dietary concentrations of 50, 100, 360 or 650 ppm. Beginning on week 8, the high-dose was reduced to 500 ppm for the remainder of the study due to severe clinical neurological symptoms. Body weights were decreased for animals of the high-dose. Neurological findings (gait abnormalities and postural reaction deficits) were observed at doses of 360 ppm and greater. The NOEL was 100 ppm.

CARCINOGENICITY:

Imidacloprid was investigated for carcinogenicity in chronic feeding studies using mice and rats at maximum levels of 2000 and 1800 ppm, respectively. There was no evidence of a carcinogenic potential observed in either species. Cyfluthrin was investigated for carcinogenicity in chronic studies using several different strains of rats and mice. In rats, the maximum level tested was 450 ppm. Maximum levels tested in mice were 1400 and 1600 ppm for males and females, respectively. There was no evidence of a carcinogenic potential observed in any of the strains in either species.

MUTAGENICITY:

The imidacloprid mutagenicity studies, taken collectively, demonstrate that the active ingredient is not genotoxic or mutagenic. Numerous in vitro and in vivo mutagenicity studies have been conducted on cyfluthrin, all of which are negative.

DEVELOPMENTAL TOXICITY:

In a developmental toxicity study using rats, imidacloprid was administered by oral gavage during gestation at doses of 10, 30 or 100 mg/kg. At the maternally toxic dose of 100 mg/kg, skeletal examinations of the fetuses revealed a slight increase in the incidence of wavy ribs. The NOELs for maternal and developmental toxicity were 10 and 30 mg/kg, respectively. Teratogenic effects were not observed at any of the doses tested. Rabbits were administered imidacloprid during gestation at oral doses of 8, 24 or 72 mg/kg. At the maternally toxic dose of 72 mg/kg, reduced body weights and delayed skeletal ossification were observed in the fetuses. The NOELs for maternal and developmental toxicity were 8 and 24 mg/kg, respectively. Teratogenic effects were not observed at any of the doses tested. In developmental toxicity studies using rats, cyfluthrin was administered during gestation by oral gavage at doses ranging from 1 to 30 mg/kg. The overall NOEL from these studies for maternal toxicity was 3 mg/kg. No developmental effects were observed at any of the doses tested. In each study, the NOEL for developmental toxicity was equivalent to the highest dose tested. The NOELs for developmental toxicity for the initial study and the subsequent study were 30 and 10 mg/kg, respectively. Rabbits were administered cyfluthrin during gestation by oral gavage at doses ranging from 5 to 180 mg/kg. At maternally toxic levels, there was an increased incidence of post-implantation losses. The overall NOEL derived from these studies for both maternal and developmental toxicity was 20 mg/kg. In an inhalation study, rats were exposed during gestation to cyfluthrin at aerosol concentrations of 0.46, 2.55 or 11.9 mg/m3 for 6 hours/day. NOELs for maternal and developmental toxicity were less than 0.46 and 0.46 mg/m3, respectively.

TOXICOLOGICAL INFORMATION Continued:

REPRODUCTION:

In a reproduction study, imidacloprid was administered to rats for 2 generations at dietary concentrations of 100, 250 or 700 ppm. Offspring at 700 ppm, exhibited reduced mean body weights and body weight gains. No other reproductive effects were observed. The maternal and reproductive NOELs were 100 and 250 ppm, respectively. In a reproduction study, cyfluthrin was administered to rats for 3 generations at dietary concentrations of 50, 150 and 450 ppm. Reproductive effects observed at parentally toxic levels included reductions in viability, lactation, litter size, feed consumption, and pup birth weights and body weight gains. Coarse tremors were observed in some offspring at 450 ppm. The NOEL for both parental and reproductive effects was 50 ppm. In another reproduction study, cyfluthrin was administered to rats for 2 generations at dietary concentrations of 50, 125 or 400 ppm. Coarse tremors occurring in conjunction with parental toxicity were observed in the offspring in the mid- and high-dose groups. Based on this finding, the neonatal NOEL was 50 ppm. The NOELs for parental and reproductive toxicity were 50 and 400 ppm, respectively.

NEUROTOXICITY:

In an acute neurotoxicity screening study using rats, imidacloprid was administered as a single oral dose at levels of 42, 151, or 307 mg/kg. Clinical observations and neurotoxicity evaluations were performed over a period of 15 days followed by a neurohistopathological examination. Deaths attributed to imidacloprid were observed at the high dose within a day of treatment. The NOEL for motor and locomotor activity was 42 mg/kg for males. Females at the low dose exhibited minimal decrease in activity in the figure-eight maze. In a subsequent study, the NOEL for motor and locomotor activity in females was 20 mg/kg. All clinical signs and neurobehavioral effects were ascribed to acute cholinergic toxicity, with complete recovery at sub-lethal doses within 7 days following treatment. The NOEL for neurotoxicity was 307 mg/kg based on the absence of treatment-related microscopic lesions in skeletal muscle or neural tissue. In a 13 week neurotoxicity screening study, imidacloprid was administered to rats at dietary concentrations of 140, 963 or 3027 ppm. At the mid- and high-dose, effects observed included reductions in body weight and feed consumption, and clinical chemistry findings. Neurobehavioral changes were observed only in males at the high dose. There were no correlative micropathologic findings in muscle or neural tissues in any animals at any treatment level. The NOEL for neurotoxicity was 3027 ppm. The overall NOEL was 140 ppm. Numerous neurotoxicity studies have been conducted on cyfluthrin. Oral gavage studies using hens have indicated that at extremely high dose levels (5000 mg/kg), minimal nerve damage occurs. When rats were administered cyfluthrin daily at oral doses of 40 to 80 mg/kg for 14 days, minimal nerve effects were seen. These effects were completely reversible within a 3 month recovery period. In dermal and inhalation studies which are more relevant to field exposure, there was no evidence of delayed neurotoxicity in hens. In a special investigative study, litters of neonatal mice (10 days of age) and their mothers were exposed to cyfluthrin via inhalation (whole body exposure). Mice were exposed to aerosol concentrations of 5, 15, or 50 mg/m3 for 6.3 hours/day for 7 successive days. Motor activity was measured in the offspring at 4 months of age (approximately 3.5 months post-exposure). At 50 mg/m3, all of the offsprings died or were sacrificed in a moribund state following the first exposure. Mortalities were not observed at any of the other levels. Clinical symptoms were observed immediately after exposure in young mice at 15 mg/m3, and included decreased motility, temporary scratching, and tonic convulsions. There was an increase in motor activity in mice at 15 mg/m3. Histopathological investigations did not reveal any treatment-related findings in mice at the age of 4 months.

12. ECOLOGICAL INFORMATION:

This product is highly toxic to aquatic invertebrates, fish and bees. Bayer will provide a summary of specific data upon written request. As with any pesticide, this product should be used according to label directions and should be kept out of streams, lakes and other aquatic habitats of concern.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Follow container label instructions for disposal of wastes generated during use in compliance with the FIFRA product label. In other situations, bury in an EPA-approved landfill or burn in an incinerator approved for pesticide destruction. Do not reuse container.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME: Cyfluthrin and Imidacloprid

FREIGHT CLASS BULK: Insecticides, NOI - NMFC 102100

FREIGHT CLASS PACKAGE: Insecticides, NOI - NMFC 102100

PRODUCT LABEL: Not Noted

DOT (DOMESTIC SURFACE)

HAZARD CLASS OR DIVISION: Non-Regulated

IMO / IMDG CODE (OCEAN)

HAZARD CLASS DIVISION NUMBER: Non-Regulated

ICAO / IATA (AIR)

HAZARD CLASS DIVISION NUMBER: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS: This product is exempt from TSCA Regulation under FIFRA Section 3 (2)(B)(ii) when used as a pesticide.

CERCLA REPORTABLE QUANTITY: None

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES: None

SECTION 311/312 HAZARD CATEGORIES: Immediate Health Hazard

SECTION 313 TOXIC CHEMICALS: Cyfluthrin - 0.72% (CAS No. 68359-37-5)

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

16. OTHER INFORMATION:

NFPA 704M RATINGS:

Health 1	Flammability 1	Reactivity 0	Other
0=Insignificant	1=Slight	2=Moderate	3=High	4=Extreme

Bayer's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. NFPA ratings are provided by Bayer as a customer service.

REASON FOR ISSUE.: Revise Section 2 (reflect alternate formula); Section 4 (modify first aid statements)

OTHER INFORMATION Continued:	
PREPARED BY:	V. C. Standart
APPROVED BY:	D. C. Eberhart
TITLE:	Product Safety Manager
APPROVAL DATE:	06/27/2000
SUPERSEDES DATE:	10/15/1999
MSDS NUMBER:	32919

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